

LIX.—*Notulæ Lichenologicae*. No. XV.*Notes on the Lichens of Cader Idris, North Wales.*

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CADER IDRIS is a long mountainous range extending seven or eight miles in wavy length from Dolgelley, E.N.E., to the sea, W.S.W., on the southern side of the estuary of the Mawddach. Its northern face is one continuous precipitous escarpment rising abruptly from an extensive slope, formed by spurs or lower elevations, covered with boulders and fallen stones, and converted by numerous rivulets into a wet bog or morass. At its north-eastern end is a small but beautiful "Cwm," formed, as all the others are, by glacial action, enclosing with its perpendicular precipices a small tranquil lake named Llyn Aran. The stream from this lake constitutes the river Aran, which flows over the moraine into the river Wnion at Dolgelley. Westward of this, and about midway of the northern escarpment, is a large sublime Cwm, immediately below the highest point Cader (alt. 2929 feet), in which is a fine lake called Llyn-y-Gader; and below the steep moraine which retains this is another smaller lake, Llyn Gafr. Immediately opposite, on the southern side of the mountain, is another deeper and more terrific Cwm, with perpendicular precipitous sides surrounding the lake Llyn-y-Cae, whose stream flows down the steep sides of the range, joins the river in the bottom of the pass, until eventually both are lost in the great lake Tal-y-llyn. Beyond this, westward, the range is grassy, with gradual slopes almost destitute of bare rocks. The geological formation is felspathic trap and greenstone. The height of the east end is 2855 feet, and of the western 2403 feet. The summit is a narrow grassy ridge, with extensive patches of scattered stones at intervals.

I arrived by rail at Dolgelley on a Monday in July 1866, and quartered at the Ship Hotel, with good and clean accommodation, great civility and attention, and reasonable charges. The evening only afforded a brief time for reconnoitring. Tuesday morning proving showery and unpromising for ascending Cader Idris, I deferred fulfilling my intention until the next day, in hope of more propitious weather, and so determined to devote the day to a kind of home circuit in examining the shores and rocks of Llyn Gwernan, a small lake two miles south-west from Dolgelley, close to the turnpike road skirting the northern base of Cader Idris. By the way I found on the stone walls *Lecidea lithophila*, Ach. (new to Wales), *Parmelia perlata* (L.), and small quantities of *Stereocaulon Cereobus*, Borr., in fructification. On the stones around Llyn Gwernan nothing notable occurred

but a few specimens of *Endocarpon fluviatile*, DC. The sun now broke through the clouds, and tempted me to ascend to the Llyn Gafur and Gader, collecting on the way *Lecidea lithophila*, Ach., *L. fusco-atra*, Ach., *L. contigua*, Fr., in various states and stages, one with curious subgyrose apothecia arising from the inserted growth of an Alga, and another in which the apothecia were broken up into several clustered smaller apothecia; *L. lapicida*, Fr., and its var. *declinans*, Nyl. (new to Great Britain), *L. umbrina*, Ach., and its form *vermifera*, Nyl., *L. petræa*, Flot., in various states, *L. lutosa*, Mont., thallo denudato, *L. atro-alba*, Flot., *Endococcus erraticus* (Mass.) and *gemmifer* (Tayl.), the latter in an unusual state, sine thallo substrato; *Lecanora cinerea* (L.) and *calcareæ*, Ach., *L. badia*, Ach., and its var. *cinerascens*, Nyl. (new to Great Britain), *L. atra*, Ach., and *L. leucophæa*, Flk. (new to Great Britain), *Stereocaulon Cereolus*, Borr., and *S. denudatum*, Flk., and the following entirely new species:—

*Lecidea subnigrata*, Nyl.

Thus characterized by Dr. Nylander in the 'Flora,' 1866, p. 370 :

"Thallus obscure cinerascens, granulosis, diffractus; apothecia fusco-nigra vel spadiceo-nigricantia vel rufo-nigra, convexa, immarginata, sæpius conglomerata, intus concoloria; sporæ 8, incolores, ellipsoideæ, 1-septatæ, long. 0·009–0·011 millim., crass. 0·004–0·005 millim.; epithecium sordide lutescens; paraphyses non discretæ; hypothecium incolor. - Gelatina hymenea iodo cærulescens. Vix separanda a *L. denigrata*."

*Lecidea biformigera*, Leight.

Thallus sordide albus, tartareus, crassus, verrucoso-areolatus, rimoso-diffractus; apothecia conglomerata, nigra, parva, plana, tenuiter marginata; hypothecium pallidum; sporæ 8, incolores, anguste oblongæ, 1-septatæ, loculis binucleolatis.

Spores very similar in shape and size to those of *Verrucaria biformis*, Borr.

Also, in very small quantity (and new to Britain), *Lecidea Dufourei*, Ach. herb., which Dr. Nylander considers to be a good species, but which he has forgotten to insert in his 'Lich. Gall.' although the lichen has been known to him for fifteen years past.

Arrived at the lakes, the promising sunshine and the apparently short distance to the summit tempted me to persevere and endeavour to reach it, purposing to return eastwards over the ridge to Dolgelly. Noticing a well-marked road at a con-

siderable distance, which could be readily traced to the summit, I resolved to gain it by skirting the base of the precipitous escarpment. After a laborious skipping from stone to stone over a distance of about a mile, I succeeded. Looking northwards, I observed that this road could be traced winding up the spurs and slopes of the mountain, and that it was even then traversed by guides with ladies and ponies. So, though suffering much from fatigue, and having no refreshment with me except some whiskey, not having set out with the intention of making so extended an excursion, I concluded that I was in the right track, and should eventually gain the summit, where I expected to find a hut at which, as on Snowdon, refreshments might be procured. As I ascended, I examined the rocks close to this path, and instantly lost all my weariness on discovering *Platygrapha tesserata* (DC.) (Leight. Brit. Graph. p. 8, t. 5. f. 1) in fine state and in plenty, and also *Lecidea Bruyeriana*, Schaer. (new to Great Britain), of which I bagged some goodly specimens. The latter lichen, I believe, is new to our flora; and its chemical reaction shows that it is distinct from *L. coarctata*, Ach., f. *ornata* (Somrf.), with which some lichenologists have allied it.

My attention being thus diverted, I soon lost all trace of the ascending ladies and guides, whom I saw no more; and time (5 P.M.) warned me that it would be prudent to proceed and gain the summit. No sooner had I set my feet on it, than a dense mist enveloped the whole mountain, through which I could see scarcely two or three yards in advance. However, judging I should scarcely go wrong, I followed the beaten path, which, however, I soon discovered was leading me over the mountain down to the southern or Tal-y-llyn side. Taking out my pocket compass, I steered eastwardly and struck another beaten path, which, after pursuing for nearly half a mile, suddenly terminated in a patch of scattered stones. The dense mist still continuing, I grew somewhat alarmed, dreading the possibility of having to pass the night on these heights, as the descent down the precipitous sides in a mist would be a dangerous risk. Still wandering about, I alighted on another path, which conducted me into rather fearful proximity to the yawning abyss of Llyn-y-Cae. This roused me to watchfulness, and, knowing that I could not be far now from the highest point, I kept more to the left along a track on the edge of the northern escarpment, and gained the Gader and the hut adjoining. But, oh! painful disappointment! no provisions, no inhabitant; nothing but a squalid den of blocks of stones, dripping with wet and begrimed with filth. My alarm now increased; and after proceeding a short distance forward, I returned to the hut, resolving under the circumstances to remain there

during the night, where at all events I should have shelter and safety, if nothing else. Second thoughts urged me to go forward, knowing that, whilst maintaining the ridge, I was safe, and, at the same time travelling eastwards, was in the right direction to eventually reach Dolgelley. The mist now rose a little; and, seating myself for rest, I watched with admiration and awe the mighty mists whirled upwards from the cwms and hollows of the sides, like steam from some huge boiling cauldrons, in very grand and sublime masses. The mist at intervals also opened and closed, alternately revealing and again enveloping glimpses of the beautiful mountainous and wooded scenery lit up by bright sunshine, on the Barmouth side of the estuary, and resembling immense magnificent dissolving views. Turning my eyes eastwards, to my astonishment I caught a glance of what appeared, through the mist, as a man six or seven feet high, with two huge dogs. I halloed; and he fortunately heard, and awaited my coming up to him, when, lo! he proved to be a boy about fourteen, with two shepherd dogs: such was the illusion caused by the mist. With anxious earnestness I entreated him to guide me down, stating that I was a stranger and had lost my way. Luckily he understood English, but stoutly refused to be my guide, saying his home lay on the southern side of the mountain, and merely indicating the position of Dolgelley. Knowing the powerful attraction of money, I pulled out some coins and offered them if he would be my guide. Still without effect. As a last resource, I in despair asked him how I must get down, when he merely pointed with his finger down the precipices, saying "Down there, down there." So, bidding him good-bye, I commended myself to Providence, and descended the precipices slowly and cautiously. To my great astonishment and delight, the mist now entirely and suddenly cleared off, and the sun once more broke out in splendour. I now recognized that I was descending the far-famed Llwybyr Cadnaw, or "the Foxes' Path," a steep and fatiguing slope of loose débris and broken stones, and was striking the lake Llyn Gader, the very point from which I had ascended in the earlier part of the day. Most thankful did I feel, and, draining my last drop of whiskey, addressed myself to steering as straight a course as possible across the morasses and spurs to Dolgelley, throwing myself down, ever and anon, in sheer fatigue and exhaustion, for a few moments' rest. Eventually I gained my inn, refreshed exhausted nature, and turned in for a glorious and welcome night's sleep.

I may here remark that there is in reality no real danger in ascending any of the Welsh mountains alone and without a guide. The great use of guides is that, in a strange moun-

tainous country, they can point the easier and readier way of ascent and access. Moreover it is always well to have a companion in the event of mists coming on, or for procuring immediate assistance in case of a sprained or broken limb on the rocks, since a person prevented from walking by such an accident might remain for days even without anybody coming near him or hearing his cries for aid.

Next morning I took the coach and travelled through the beautiful scenery of the estuary ten miles to Barmouth, encountering a fierce storm of hail and rain *in transitu*. This day's collecting on the rocks immediately above and around Barmouth yielded the following:—*Spilonema paradoxum*, Born., in fruct.; *Ephebe pubescens*, Fr.; *Physcia erosa* (Borr.); *Lecanora cervina*, Ach., var. *smaragdula*, *sinopica*, and *simplex*; *Lecidea stellulata*, Tayl.; *Lecidea lævigata*, Nyl.; *Pertusaria ceuthocarpa*, T. & B.; *Lecidea enterochlora*, Tayl.; *Lecidea fuliginosa*, Tayl.; *Opegrapha Chevallieri*, Leight.; *Lecanora epanora*, Ach.

Returning to Dolgelley by rail, I picked up on the trees near Pen-maen-pool *Lecidea bacillifera*, Nyl. (new to Wales).

The following morning proving rainy, I wandered before breakfast along the Bala road, and there, about one mile from Dolgelley, gathered *Sticta limbata*, Sm., and *fuliginosa*, Dicks., and on a Scotch fir by the roadside discovered a new species of *Opegrapha*, which Dr. Nylander has thus named and characterized in the 'Flora,' 1866, p. 374:—

“*Opegrapha amphotera*, Nyl.

“*Similis O. varia* f. *diaphora*, apotheciis sat confertis; sed sporæ tenuiores (long. 0·030–0·035 millim., crassit. 0·0035–0·0045 millim.), septis 5–9 (vel sæpius indistinctis). Hybrida quasi inter *O. variam* et *vulgatam*.”

After breakfast, the weather clearing up a little, I took an unfrequented road across the base of the eastern spur of Cader Idris to the Cross Foxes on the Tal-y-llyn road, and on the stone walls there gathered *Lecidea lucida*, Ach., in magnificent and abundant fructification, *Lecidea sabuletorum*, var. *milliaria*, with fine and plentiful spermogonia on the mosses, *Pannaria muscorum* (Ach.) in fruit, *Leptogium muscicolum*, Fr., *Stereocaulon denudatum*, Flk., with magnificent cephalodia. Proceeding onwards to a little tarn on the roadside, Llyn Trigraienyn, the fine view of the whole pass, with the lake Tal-y-llyn, bursts on the sight—so beautiful as not soon to be forgotten. Close to the tarn are the “Giant's Pebbles,” on which I found *Cetraria aculeata*, Ehrh., *Alectoria bicolor*, Ehrh., *Platysma sæpinolum*, Hoffm., and a new species of *Lecidea*, in very small quantity,

which Dr. Nylander has named *Lecidea rusticula*, and thus describes in the 'Flora,' 1866, p. 371 :—

“*Lecidea rusticula*, Nyl.

“Thallus albidus, granulis constans depressis subcrenatis; apothecia nigra, minuta (latit. 0·2 millim. vel parum amplius), planiuscula (juniora obtuse marginata); sporæ 8, incolores, ellipsoideæ, long. 0·010–0·015 millim., crass. 0·005–0·008 millim.; epithecium vage fuscescens; paraphyses haud discretæ; hypothecium fuscum. Gelatina hymenea iodo intense cærulescens, dein sordide lutescens. Sporis majoribus, thallo, &c., differt a comparanda *L. dispansa*, Nyl. in 'Flora,' 1866, p. 87.”

Lunched at the little roadside inn at Minffordd, and retraced my steps to Dolgelley for the night.

I was now joined by my friend Dr. John Fraser, of Wolverhampton; and we essayed the ascent of Cader Idris by the lakes, purposing to examine carefully the northern escarpment. We had, however, scarcely surmounted the moraines before a beating hailstorm and pelting rain chilled, benumbed, and wetted us to the skin, compelling us to halt and seek shelter amid the boulders. But, no abatement in the storm occurring, we were obliged to descend and return home through the morass, which (and even the turnpike road itself) was swimming with water several inches deep. Our gatherings were necessarily trifling—*Parmelia conspersa*, Ach., with spermogonia, *Lecanora cervina*, Ach., var. *rufovirescens*, Tayl., and a few other species before enumerated. The evening was spent in a walk to the famous “Torrent Walk,” which proved to my friend a very paradise of mosses, but afforded nothing of any interest in lichens.

Nothing daunted, we next day tried Cader Idris from the north-west, purposing to traverse the summit eastward to Dolgelley, but were again beaten back by dense mists and drenching rain, collecting nothing save *Lecidea milliaria*, Fr., f. sporis subsimplicibus, *Lecidea flavovirescens*, Mass., *L. bacillifera*, Nyl., f. *muscorum*, *L. coarctata*, Ach., f. *elachista*, Ach., *Lecanora ventosa*, Ach., thallo pallidiore, and *Lecidea rivulosa*, Ach.

A fine day now tempted me (in the absence of my friend, who went to Barmouth in search of mosses) to a stroll along the Festiniog road, on the banks of the river flowing through this most beautiful and picturesque valley. Here, on the stone walls, roadsides, and trees, I met with *Opegrapha saxatilis*, DC., *Verrucaria gemmata*, Ach., *V. margacea*, Whlnb., var. *æthiobola*, Whlnb., *V. rupestris*, Schrad., *V. chlorotica*, Ach., *V. nitida*, Schrad., *Arthonia Schwartziana*, Ach., and *A. epipasta*, Ach.,

*Lecidea stellulata*, Tayl., *L. chalybeia*, Borr., *L. Cederi*, Ach., *L. vernalis*, Fr., *L. sabuletorum*, Flk., states of *Lecanora cinerea* (L.), *L. calva* (Dicks.), *L. pyracea*, Ach., and *L. aurantiaca* (Lightf.), and *L. galactina*, Ach., *Lecanora sophodes*, Ach., forma *virescens*, *Bæomyces icmadophilus* (Ach.), and a new *Sphæria* growing parasitically on the thallus of *Lecanora tartarea* or its variety *pallescens*, and which Dr. Nylander, to whom I submitted it, proposes to name *Sphæria tartaricola*, Nyl.

Our last day was devoted to the east end of the range, about Llyn Aran, and was a glorious one. This portion seems but little frequented; for we here observed *Saxifraga nivalis* (L.), *Oxyria reniformis* (Hook.), *Sedum Rhodiola* (DC.), *Thalictrum minus* (L.), *Asplenium viride* (Huds.), *Cystea dentata*, Sm., &c.

Mylichen-gatherings were:—*Stereocaulon cereolus*, Borr., abundant and in fine fructification, and with pycnides; *Stereocaulon denudatum*, Flk., scarce; *Lecidea panæola*, Ach. (new to England), *L. excentrica*, Ach. (new to Great Britain), *L. phæops*, Nyl. (new to Great Britain); *Abrothallus Welwitschii*, Tul.; *Lecanora leucophæa*, Flk., abundant; *L. irrubata*, Ach.; *L. murorum*, Hffm., var. *obliteratum*, Pers.; *Normandina pulchella* (Borr.); *Endococcus gemmifer*, Tayl.; *Verrucaria Sprucei*, Leight.; *V. mesotropa*, Nyl., n. sp.; and *Lecidea advertens*, Nyl., n. sp. The two latter are thus described by Dr. Nylander in the 'Flora,' 1866, p. 419:—

“*Verrucaria mesotropa*, Nyl.

“Thallus pallidus, tenuis, inæqualis; apothecia nigra, turgidula; perithecio convexo, dimidiatim nigro (latit. 0·15–0·20 millim.), epithecio vix distincto; sporæ 8, incolores, ovoideæ vel ovoideo-oblongæ, 1-septatæ (vel septo spurio), long 0·012–0·017 millim., crass. 0·005–0·006 millim.; paraphyses nullæ. Gelatina hymenea iodo vinose rubens. Affinis videtur *V. superpositæ*. Gonidia viridia (latit. 0·004–0·006 millim.), sæpe oblonga.”

“*Lecidea advertens*, Nyl.

“Thallus olivaceo-nigricans, tenuis, subfurfurellus, indeterminatus; apothecia nigra, minuta (latit. 0·2–0·3 millim.), demum convexiuscula, immarginata, intus concoloria; sporæ 8, incolores, ellipsoideæ, longit. 0·011–0·014 millim., crassit. 0·007–0·009 millim.; epithecium sordide cærulescens; paraphyses non discretæ; hypothecium nigrum vel fusco-nigrum. Gelatina hymenea iodo cærulescens.

“Facie *Spilonematis revertentis*, sed thallo tenuiore texturaque omnino alia, scilicet gonidia. Thallus gonidiis constans chroolepoidee concatenatis, filamenta sistentibus articulata (crassit. 0·014–0·018 millim.), chlorophyllo viridi in cavitatibus rotun-

datis, parietibus crassulis; si thallus non est alienus, hæc species proprium genus sistit, quod *Heterostroma* dicere liceat. Conferendus est thallus in *Thelopsi melathelia* (quam etiam ad Onegam detexit præstantissimus Simming) etiam texturam *Chroolepi* habens, ut facile crederes hic agi de lichenibus parasitis.”

We scrambled to the summit, traversing the ridge, finding nothing but *Lecidea rivulosa*, Ach., and *L. contigua*, Fr., on the very highest points, and descended by the Foxes' Path, where *Allosorus crispus* (Bernh.) grows abundantly, and where I also gathered *Placopsis gelida* (L.).

Thus this excursion has added to our British Flora a score of new lichens, of which six are entirely new to lichenology, and a new species of *Sphæria*,—proving that our Welsh mountains, if thoroughly searched, would yield an abundant harvest of good, rare, and novel lichens, and probably many novelties in other natural orders.

Dr. Fraser kindly permits me to add a list of the mosses which he found near Dolgelley, chiefly on Cader Idris:—

|   |                                      |
|---|--------------------------------------|
| <i>Andreæa alpina</i> .                 | <i>Orthotrichum Lyellii</i> .        |
| — <i>rupestris</i> .                    | — <i>crispum</i> .                   |
| — <i>Rothii</i> .                       | <i>Diphyseium foliosum</i> .         |
| <i>Sphagnum acutifolium</i> (in fruit). | <i>Pogonatum urnigerum</i> .         |
| <i>Gymnostomum rupestre</i> .           | — <i>alpinum</i> .                   |
| <i>Dicranum squarrosum</i> .            | <i>Bryum polymorphum</i> .           |
| — <i>heteromallum</i> .                 | — <i>crudum</i> .                    |
| — <i>falcatum</i> .                     | — <i>pseudo-triquetrum</i> .         |
| — <i>majus</i> .                        | — <i>alpinum</i> .                   |
| <i>Leucobryum glaucum</i> .             | — <i>cirrhatum</i> (intermedium).    |
| <i>Campylopus longipilus</i> .          | — <i>nutans</i> (a variety).         |
| <i>Distichium capillaceum</i> .         | — <i>Zierii</i> .                    |
| <i>Didymodon rubellus</i> .             | <i>Entosthodon Templetoni</i> .      |
| — <i>cylindricus</i> .                  | <i>Physcomitrium ericetorum</i> .    |
| <i>Trichostomum homomallum</i> .        | <i>Bartramia fontana</i> .           |
| <i>Encalypta vulgaris</i> .             | — <i>pomiformis</i> .                |
| <i>Hedwigia ciliata</i> .               | — <i>ithyphylla</i> .                |
| <i>Schistidium maritimum</i> . (Bar-    | — <i>arcuata</i> .                   |
| mouth.)                                 | <i>Tetraplodon mnioides</i> .        |
| <i>Grimmia Doniana</i> .                | <i>Cedipodium Griffithianum</i> .    |
| — <i>patens</i> .                       | <i>Anæctangium compactum</i> .       |
| <i>Racomitrium aciculare</i> .          | <i>Antitrichia curtispindula</i> .   |
| — <i>fasciculare</i> .                  | <i>Hypnum rutabulum</i> (a variety). |
| — <i>heterostichum</i> .                | — <i>loreum</i> .                    |
| — <i>lanuginosum</i> .                  | — <i>revolvens</i> .                 |
| <i>Ptycomitrium polyphyllum</i> .       | — <i>pulchellum</i> .                |